

Appendix 8: Further technical guidance related to noise pollution

Annex A: Quick reference guides – When is an acoustic report required?

(i) NEW NOISE SENSITIVE DEVELOPMENT (NSD) / USES				
Type of development		Noise Report required?	Comments	
New residential development and extensions to existing residential dwellings (C3 –Dwellinghouses and C4 - Houses in multiple occupation use classes)	Close to a major highway (motorways, A-class & major or busy B roads)	YES	Noise report will normally be required for residential development in proximity to a major or busy road. A noise report is unlikely to be required when noise levels fall below 50dBA LAeq16hr.	
	Near to a railway	YES	Noise report will normally be required for any property within several hundred meters from a major railway line. A noise report is unlikely to be required when noise levels fall below 50dBA LAeq16hr.	
	Within the predicted 57dB contour of an airport with both a single or twin wide spaced runway	YES	Noise report will normally be required. Noise reports can be found via the DfT website.	
	Close to existing or proposed NGD such as agricultural, industrial, trade, commercial or business premises		Noise report will normally be required.	
	10+ houses in a rural/ suburban environment	MAYBE	In certain circumstances, a noise report will be required. Please consult with Environmental Health Department.	
Change of use to residential		MAYBE	Noise report may be required, for example if there are existing noise sources in close proximity. Please consult with the LPA.	
Hotels, guest houses, etc (C1 uses)		MAYBE	It is the responsibility of the developer to ensure hotel rooms meet reasonable noise standards. However, if the hotel/ guest house includes long term Hotels, guest houses and residential institutions can also present a new noise source. Consequently, if	
Residential institutions: C2 uses (care homes, hospitals, nursing homes, residential colleges, etc), and C2a uses (secure residential institutions including prisons, secure hospitals)		MAYBE		

		residential accommodation for staff or is an aparthotel, a noise report may be required.	such a development is proposed in close proximity to existing residential uses, a noise report may be required.
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(ii) NEW / ADDITIONAL NOISE GENERATING DEVELOPMENT (NGD) SOURCES		
Type of development	Noise Report required?	Comments
INDUSTRIAL TYPE USES (e.g. B2 general industrial uses, B8 storage or distribution uses, Waste management sites, Minerals development, access roads & haul roads)	YES	Noise report will normally be required. Please consult with LPA if there are no existing noise sensitive premises in close proximity. However noise may need to limit creeping background noise levels in the general area. Includes new development and changes of use. Also includes changes in operations or layout, extensions or new equipment at existing sites.
ENTERTAINMENT/ FOOD & DRINK, ETC (e.g. A3 uses - restaurants/ cafes, A4 - drinking establishments, A5 - hot food a takeaway, D2 uses e.g. cinemas, concert halls, swimming baths, skating rinks, gymnasiums, sports halls. Also dance halls, casinos, theatres, amusement centres).	YES	Noise report will normally be required. Please consult with LPA if there are no existing noise sensitive premises in close proximity. However noise may need to be limit creeping background noise levels in general area. Includes new heating, ventilation, and air conditioning (HVAC) including combustion appliance / exhaust stacks and flues and air handling/refrigeration / chiller units, machinery, plant and equipment and extractor fans at new and existing. The noise impact of car parking / vehicular movements should also be considered
OUTDOOR SPORTS AND RECREATION Including some D2 class uses, also multi-use games areas, motor sports and shooting ranges.	YES	Noise report will normally be required.
COMMERCIAL USES A1 and A2 uses (shops and financial/ professional services, etc)	MAYBE	Noise report will normally be required in the following circumstances:
OFFICES, ETC B1 uses (including offices, light industry)	MAYBE	- The application involves the introduction of new uses and the development is greater than small scale (e.g. a new supermarket or several shops, a new office block/ industrial estate, a new school/

NON-RESIDENTIAL INSTITUTIONS D1 uses (non-residential institutions, e.g. day centres, schools, libraries, places of worship, training centres)	MAYBE	library), or - The application includes heating, ventilation, and air conditioning (HVAC) including combustion appliance / exhaust stacks and refrigeration / chiller machinery, plant and equipment and extractor fans at new and existing sites etc, or
OTHER Other Sui Generis uses, e.g. theatres, scrap yards, petrol filling stations, car / vehicle washing facilities, launderettes, taxi businesses scrap yards, retail warehouse clubs, nightclubs and casinos, beauty salons and Nail Bars	MAYBE	- The development would involve activities during unsociable hours (including deliveries), or - The development would involve particularly noisy processes, activities and sources (including during construction) or is proposed in proximity to noise-sensitive premises.
TRANSPORT SCHEMES e.g. new roads, rail, port and airport development, including extensions / alterations to existing schemes	YES	Early consultation with the Local Planning Authority/Environmental Health department would be expected.
WIND TURBINES	YES	Early consultation with the local planning authority/ environmental health department would be expected. Micro wind turbines may not require planning permission, however in some cases they may cause a statutory noise nuisance to neighbours. Please contact the Environmental Health Department

Annex B: General Requirements for Acoustic Reports and Assessments

1. Developers should also seek guidance from the Council's Environmental Health team prior to any acoustic survey work being carried out in order so they can advise on the best methodology for the proposed development and any bespoke reporting for developments.
2. Assessments should be carried out and produced by a suitably qualified and competent consultant and conform to the standards in *BS7445 1-3:2003 Description and measurement of environmental noise* (or any later replacement guidance).
3. Noise surveys on site should be carried out for appropriate duration to ensure representative noise levels are ascertained. They should be undertaken for typically 5 to 7 days and should include weekends.
4. Monitoring locations should be agreed in advance.
5. As assessment and guidance for noise and vibration control is always evolving, applicants must ensure that they consider amendments or updates to existing noise guidance.
6. The appropriate amount and detail of information required will depend on the specific circumstances of a proposal.
7. It should be noted that noise assessment and report writing is a skilled operation and should be undertaken only by competent persons. Notwithstanding the inevitable technical content of the subject matter the best acoustic reports are written using plain English and should be possible for a lay person to understand. The acoustic report should be well structured and precise in its use of language and presentation of data.
8. A typical acoustic report should include the following information.
 - (i) Introduction**
 - a. Outline the scope, aims and objectives of the report.
 - b. Include the site address or other location details.
 - c. Include a brief description of the development proposal it relates to (with the correct case reference number).
 - d. Clearly identify the client and/or person who commissioned the survey(s).
 - (ii) Executive Summary**

This should contain the summary of the whole report and a clear statement regarding delivery of the aims and objectives.
 - (iii) Title Page**

Shall have a title page identifying the person and organisation undertaking the survey and writing the report and their qualifications and contact details, the date of

the report, and shall be signed by the author and quality control reviewers. Document references i.e. revision and version numbers should be included to indicate the development of the report and its status e.g. draft for comment, final etc.

(iv) Contents Page

Here the contents of the report shall be listed.

(v) Methodology

- a. Clearly identify applicable guidelines and standards from this SPD.
- b. Detail any other standards / policies to be used and give a brief outline of why they have been chosen.
- c. Provide detail and justification where accepted standards have not been used.
- d. Outline the process to be followed.

(vi) Site Description and Noise Measurements

- a. A brief qualitative description of the site and its surroundings is useful here.
- b. Labelled and annotated photographs are often very useful in communicating the nature and character of the site and its environs.
- c. Details of how any noise survey was carried out and any observations made during the survey e.g. on typical or unusual noise sources making up the acoustic environment.
- d. Detail the location, dates and times of all measured data and provide suitable summaries of results obtained. Clearly state the height above ground, ground conditions and proximity of any acoustic reflecting surfaces (i.e. façade, free-field or reverberant conditions). Photographs of noise measuring equipment in-situ may be useful here.
- e. Clearly state the reasons for the chosen measurement positions.
- f. Provide clear explanations for any unusual or anomalous results.
- g. Provide details of the equipment used i.e. make model and serial numbers of sound level meters, field calibrators etc.; details of equipment calibration history; details of field calibration.
- h. Detail the weather conditions during the survey period. Include wind speed, wind direction, temperature and precipitation. Average wind speeds above 5 m/sec and persistent heavy rain are not conducive to effective noise measurements, although intermittent light rain and gusts over 5 m/sec can be tolerated.

(vii) Noise Predictions

Where it has been necessary to predict noise levels, then a brief explanation of how this has been undertaken, the data used, the software used, the prediction standards used, and any assumptions made are required. Details of any validation checks should be included.

(viii) Noise Source Emission Levels

Whether the scheme is noise sensitive or is likely to generate noise the report should include the following:

- Details of the type, number, location and spatial relationship of noise sources and receptors

- Details of the noise emission from each noise source, at and/or within each noise sensitive receiver
- Details of how the noise emission levels were derived.

(ix) Assessment

- Give details of the assessment made based on measured and/or predicted data.
- State any assumptions made.
- Show any calculations to sufficient detail that they could be checked for accuracy (possibly in an Appendix).

(x) Outcome of Pre-Survey Discussions with the LPA, Including Potential Noise Conditions

Here the report should discuss the outcome of any pre-survey discussions with the LPA, including any acoustic standards the LPA wishes to see used on the scheme; and the details and justification of any alternatives the applicant may wish to propose.

(xi) Mitigation

The report should clearly identify any mitigation measures that may be required in order to comply with the guidance and standards in this SPD.

All proposed noise management measures that have been considered and their effectiveness should be presented and discussed so as to enable informed recommendations on suitable mitigation measures.

(xii) Recommendations and Conclusions

This section should clearly reflect the scope, aims and objectives of the report. Where the report is supporting a planning application then it should normally recommend what noise management measures should be taken by the developer in order to demonstrate that:

- The adverse effects of noise as a consequence of the new development have been mitigated and minimised in accordance with the guidance in this SPD.
- Good acoustic design principles have been considered and applied given the particular circumstances of the proposed development in accordance with the guidance in this SPD.

(xiii) Appendices

The amount of material included in any Appendices should be proportionate to the assessment and may typically include the following:

- Plans, maps, photographs showing site location and monitoring/prediction locations,
- Unabridged details of noise monitoring where critical to recommendations and conclusions,
- Details of any calculations relied upon,
- Copies of equipment calibration certificates.

9. Note:

Further practical guidance on undertaking and reporting environmental noise and vibration measurements can be found in the “ANC Green Book” - Environmental Noise Measurement Guide and the “ANC Red Book” - Measurement and Assessment

of Groundborne Noise and Vibration: both available from the Association of Noise Consultants.

Assessment by Suitably Qualified and Competent Person

10. The assessment of noise is a complex task requiring specialist training, experience, techniques and equipment. Consequently, noise surveys, impact assessments, mitigation design and report writing is best carried out by suitably qualified and competent persons with appropriate knowledge, skills and experience. The LPA is not able to endorse or recommend the services of individual consultants.

11. However, details of acoustic consultants may be obtained from:

The Institute of Acoustics

Silbury Court, 406 Silbury Boulevard, Milton Keynes, MK9 2AF

Tel: +44 (0) 300 999 9675

Email: ioa@ioa.org.uk

The Association of Noise Consultants

19 Omega Business Village, Thurston Road, Northallerton, DL6 2NJ

Tel: +44 (0)20 8253 4518

Email: info@theanc.co.uk

The Chartered Institute of Environmental Health

Chadwick Court, 15 Hatfields, London, SE1 8DJ

Tel: +44 (0)20 7827 5800

Annex C: Summary of Noise Effect Levels and Planning Outcomes / Advice for “Absolute anonymous noise” and “Relative non-anonymous noise”

Table 1: Guideline “Absolute” Sound Levels for “anonymous noise”¹

Absolute Level:		≤40dB	41 - 45dB	46 - 50dB	51 - 55dB	56 - 60dB	60-69dB	>69+dB
Absolute Sound Level	Daytime Effect:²	NOEL	NOEL	NOEL	LOAEL	SOAEL	SOAEL+	Unacceptable Adverse Effect
	Evening Effect:³	NOEL	NOEL	LOAEL	SOAEL	SOAEL	SOAEL+	Unacceptable Adverse Effect
	Night-time Effect:⁴	NOEL	LOAEL	SOAEL	SOAEL	SOAEL	SOAEL+	Unacceptable Adverse Effect
	Effect / Impact Description:	No observed effect on health or quality of life.	Sleep disturbance in bedrooms with window open.	Speech intelligibility within living areas with windows open resulting in moderate annoyance. Greater potential for sleep disturbance and adverse health impact.	Increased potential for sleep disturbance, including significant adverse health effects. Gardens and amenity spaces affected.	Noticeable and disruptive Significant adverse health effects likely to all habitable rooms. Occupants unable to open windows due to noise ingress and unable to enjoy garden / amenity areas.	Noticeable and disruptive High risk of significant adverse health impact. Unable to use garden and amenity space or have windows open for ventilation.	Noticeable and very disruptive Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological

								effects
Mitigation Considerations:	A1 Use design, layout and landscaping (DLL) to create and preserve areas of amenity and tranquillity to enhance the noise environment.	A2 Protect bedroom facades from noise through DLL. Provide minimum double-glazing with trickle vents to bedrooms.	A3 Protect habitable room facades from noise through DLL with greater protection for bedrooms. Provide higher spec double-glazing with trickle-vents to all habitable rooms.	A4 Bedroom facades to be protected through DLL to bring below LOAEL. Provide higher spec double-glazing with trickle vents to all habitable rooms. Protection of gardens and amenity space through DLL and acoustic barriers / fencing.	A5 Bespoke assessment of noise mitigation needs, including consideration of: alternative to open window ventilation provision to protect internal noise environment. Protection of garden / amenity areas through DLL to bring below LOAEL.	A6 Bespoke assessment of noise impact and mitigation, including : DLL, protection of building envelope and provision of alternative amenity space		Unavoidable and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects
Planning Consideration:	"Grant Consent - No Objection on Noise Grounds" No specific measures required	"Grant Consent - No Objection – Minimise Noise" No objection in principle subject to the inclusion of suitable noise conditions: Approved Plans and/or conditions to include satisfactory	"Grant Consent - No Objection – Minimise Noise" No objection in principle subject to the inclusion of suitable noise conditions mitigating and reducing noise to a minimum.	"Grant Consent - No Objection – Minimise Noise" No objection in principle subject to the inclusion of suitable noise conditions mitigating and reducing noise to a minimum.	"Refusal / Object - Avoid on Noise Grounds" Possibly Object - Should avoid but may be possible to mitigate and reduce noise to a minimum. Details of noise mitigation to be included as part of planning approval process.	"Refusal / Object - Avoid on Noise Grounds" Possibly Object - Presumption against planning permission being granted. Avoid Unless detailed noise impact assessment and approved noise mitigation control	"Refusal / Object - Prevent on Noise Grounds" Object: Prevent - Planning consent should be refused on noise grounds regardless of	

		<p>window acoustic performance specification to bedrooms with facades exposed to LOAEL noise.</p>	<p>Approved Plans and/or conditions to include satisfactory window acoustic performance specification to all habitable rooms with facades exposed to LOAEL to SOAEL noise.</p>	<p>Details of noise mitigation to be included as part of planning approval process.</p> <p>Conditions required to secure implementation of mitigation / acoustic control measures within the noise report.</p> <p>Refusal if noise report is inadequate.</p>	<p>Conditions required to secure implementation of mitigation / acoustic control measures within the noise report.</p> <p>Refusal if noise report is inadequate.</p>	<p>measures implemented through conditions.</p> <p>Possible post completion verification of mitigation measures required.</p> <p>Refusal if noise report is inadequate.</p>	<p>other considerations (“prevent”).</p>
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Notes:

- The absolute sound level $dBL_{Aeq}(T)$, includes the combined external free-field noise level from all sources of transport noise and may also include industrial/commercial noise where this is present but not “dominant”. T of $dBL_{Aeq}(T)$ is the reference time period for the relevant Day, Evening or Night-time period see notes 2 to 4 below.
 - ²Day is from 07:00 to 19:00 and the reference time period (T) is 8 hours.
 - ³Evening is from 19:00 to 23:00 and the reference time period (T) is 4 hours.
 - ⁴Night is from 23:00 to 07:00 and the reference time period (T) is 8 hours.
- For the specific purposes of the assessment, industrial/commercial noise should be taken as “dominant” where the effect would be likely to be rated as adverse if a BS4142:2014 assessment was to be carried out. The judgement on whether or not to undertake a BS4142 assessment should be proportionate to the level of risk. In low risk cases a subjective judgement of dominance, based on audibility, would normally be sufficient.
- It should always be clearly stated whether an industrial/commercial noise contribution has been included or excluded from the assessment.
- $LA_{eq,16hr}$ is for daytime 0700 – 2300, $LA_{eq,8hr}$ is for night-time 2300 – 0700.
- $LA_{max,F}$ criteria will place the site in SOEL, regardless of other acoustic criteria, if the maximum noise level is likely to be exceeded more than 10 times a night (2300 – 0700).

Table 2: Guideline “Relative” Sound Level Standards for “non-anonymous noise”⁵

		< -10dB	-10dB to -5dB	-5dB to 0dB	+1dB to +5dB	+6dB to +10dB	> +10dB
Relative Sound Level	Relative (Rating) Level:						
	Effect:	NOEL	NOEL	NOEL	LOAEL	SOAEL	Unacceptable Adverse Effect
	Effect / Impact Description:	Sound is likely to be inaudible and have no discernible impact on health or quality of life.	Sound will become audible, although should not cause a change in behaviour or have an adverse impact on health or quality of life.	Sound will become more noticeable, particularly if the sound has characteristics which make it distinguishable from general environmental noise. However this should not result in a change in behaviour or adverse impact on health, although the context and attitude to the noise source could influence the subjective response to the sound.	Sound from the source is likely to be noticeable and can give rise to an adverse response, such as annoyance and behaviour change, for example having to close windows to cut out unwanted noise.	Sound is increasingly likely to be noticeable and intrusive resulting in significant adverse impacts such as sleep disturbance, annoyance and have an adverse health impact.	Sound is very likely to be very noticeable and intrusive resulting in unacceptable significant adverse impact on health and quality of life.
Mitigation Considerations:	R1 Use good design, layout and landscaping (DLL) principles to create and preserve areas of amenity and tranquillity to enhance the noise environment and	R2 Use principles outlined in R1	R3 Use principles outlined in R1, with particular emphasis on protecting bedrooms and other habitable rooms from the noise, for example by	R4 Use principles in R1 and additional structural mitigation such as an acoustic barrier ⁶ , or other structure and higher spec double glazing to	R5 Bespoke assessment of noise mitigation needs, including consideration of alternative to open window ventilation provision to protect	R6 Bespoke assessment of noise impact and mitigation, including DLL, protection of building envelope and provision of	

	consider if sound reduction at source can be achieved within the design of the development.		separation from noise source, orientation of buildings and by the provision of higher spec double glazing with trickle vents to habitable rooms.	habitable rooms with trickle ventilation.	internal noise environment and protection of garden / amenity areas through DLL to bring below LOAEL.	alternative amenity space
Planning Consideration:	<p>“Grant Consent - No Objection on Noise Grounds”</p> <p>No objection and no specific noise measures required.</p>	<p>“Grant Consent - No Objection – Minimise Noise”</p> <p>No objection, but developers should consider good design principles to preserve and enhance the noise environment.</p>	<p>“Grant Consent - No Objection – Minimise Noise”</p> <p>Consider good design principles to preserve and enhance the noise environment, with particular emphasis on protecting habitable rooms.</p>	Approved Plans and/or conditions to include structural noise mitigation and satisfactory window specification to all habitable rooms with facades exposed to LOAEL noise. Potential refusal if noise mitigation not included.	<p>Details of noise mitigation to be supplied as part of planning approval process.</p> <p>Conditions required to implement control measures within the noise report.</p> <p>Refusal if noise report is inadequate.</p>	Presumption against planning permission being granted, unless detailed noise impact assessment and approved mitigation measures implemented through conditions. Post completion verification of mitigation measures required.

⁵The relative sound describes the difference between a specific and identifiable sound source compared to the background noise when the specific noise is not present. The methodology in BS4142:2014 - *Method for Rating Industrial and Commercial Sound* should be used to determine the relative sound level and is comparable to the Rating level within the Standard.

⁶Acoustic barriers for R4 mitigation should break the line of sight between the noise source and receiver, be of solid construction with no gaps and with a minimum superficial density of 4kgm⁻¹. Acoustic barriers for R5 mitigation or above should be tailored to achieve the specific noise mitigation for the site.

Annex D: Specific Noise Generating Development Uses - Industrial, Trade / Commercial or Business – Noise Requirements

1. Common sources of NGD include the following:
 - Sound Insulation between Commercial and Residential Development – General
 - Delivery and Collections
 - Places of Entertainment (Food Restaurants, Clubs, Pubs and Bars)
 - Multi Use Games Areas and Artificial Grass Pitches
 - Gyms
 - Nurseries
 - Wind Turbines
 - Agricultural buildings

Sound Insulation between Commercial and Residential Development - General

2. The requirements of the Building Regulations are usually deemed to be adequate for the control of sound insulation internally between dwellings. However, the LPA encourages applicants to adopt higher standards. In particular, the requirements of the Building Regulations can be inadequate where certain types of commercial use adjoin residential use.
3. The level of sound insulation performance required will be dependent upon the use type, for example a higher level of airborne sound insulation performance will typically be required for a proposed commercial catering unit located below a residential flat than will be required for a small café. Higher standards would also be appropriate when D1 and D2 use classes, such a dental surgery, a day nursery or a gym adjoins residential premises. The examples in Table 1 demonstrate the typical range that may need to be applied dependent on the circumstances (more stringent values may apply in some cases).

Table 1: Sound Insulation Examples - Commercial to Residential

Performance Standards for separating walls, separating floors and stairs that have a separating function		
Commercial to Residential	Airborne Sound Insulation Performance DnTw + Ctr dB	Impact Sound Transmission Performance LnTw + Ctr dB
Walls	48-60	

4. If, as a result of a planning application, a situation arises where a residential use and a commercial use will share a separating floor or wall then an assessment of the required sound insulation performance of the floor or wall should be submitted together with the construction details proposed to achieve the required standard of sound insulation.
5. In certain circumstances airborne and impact sound insulation tests may also be required by the LPA in order to demonstrate that the sound insulation performance standard has been achieved.
6. A high level of airborne and impact sound insulation, often only achievable by complex design methods that structurally isolate the noise generating and noise sensitive premises, will be required in situations such as where music and dancing or gym or health and fitness activities adjoin a residential use. Each case will take into account the specific circumstances of the proposed development, and the example limits in Table 5 may not be appropriate for assessing performance as they do not take account of the full extent of low frequency noise transmission. The following type of information would be considered in such applications:
 - Establish the noise and vibration transfer paths from source to noise sensitive receiver.
 - Establish the potential airborne and impact noise and vibration transfer magnitudes from source to noise sensitive receiver.
 - Design sound isolation and insulation treatment such as a totally isolated /floating floor on a resilient underlayment or spring-isolated floor and wall treatment which mitigates and minimises adverse noise and vibration effects and is appropriate for the types of activity being undertaken within the proposed development. An acoustic floating floor, isolated internal walls and ceiling results in a room that is completely decoupled from the surrounding building structure.
 - Undertake post completion testing to demonstrate how noise and vibration has been controlled adequately.

Delivery and Collections

7. In certain situations the noise impact from deliveries and collections will need to be determined and form part of the noise assessment. The GCPS recognises that there is sometimes a need to reduce congestion and air pollution and the retiming of deliveries is one method to assist with this sustainability objective. The LPA will therefore apply a risk based approach to applications where vehicle delivery-noise may be a source of disturbance. Where applications are for retiming of deliveries, the use of quiet technology is also encouraged in the context of wider sustainability aims.

8. The Council expects that deliveries and refuse collections to be carried out between the daytime hours 07:00-23:00hrs. Developments requiring deliveries outside of these times should provide an acoustic report to demonstrate there will be no adverse impact in relation to noise, with particular reference to residential occupiers as a result of these activities. When preparing the assessment, regard should be given to *BS4142 Method for rating and assessing industrial and commercial sound*. Developers are however encouraged to discuss their proposals with the Council's Noise team before conducting their acoustic report.
9. It is possible that restrictions on operating hours will be imposed and these will reflect the sensitivity of the area and be in the context of wider sustainability aims.
10. Where Sunday or late night and early morning deliveries/collections or retiming of deliveries are proposed, the applicant should specifically demonstrate the need for this and what measures will be implemented to prevent undue disturbance to neighbours. Further guidance on managing noise from deliveries and collections is also available at: 'Noise Abatement Society's Silent Approach™ Quiet Night Time Delivery Scheme' and 'Freight Transport Association Guidance Delivering the Goods – a toolkit for improving night-time deliveries'.
11. A Delivery Noise/Service Yard Management Plan may also be required and should include details of:
 - Times and frequency of deliveries and collections;
 - Effective enclosure and sealing of loading bays and service areas and/or locations away from noise sensitive premises;
 - Vehicle movements, including forklift vehicles;
 - Quiet reversing methods; preference will be given to broadband reversing alarms or alternative quiet safety methods for reversing;
 - Good practice working methods to minimise noise from the use of cages, trolleys, pallets and forklift vehicles - mitigation measures, such as barriers, low noise wheels on cages, low noise surfaces on tail lift decking and delivery routes for trolleys, silent electronically operated shutters etc.

Places of Entertainment (Food Restaurants, Clubs, Pubs and Bars)

12. It is recognised that clubs, public houses, bars and other places of entertainment help to achieve wider sustainable development goals. However, places of entertainment can also cause significant levels of noise disturbance and pose particular noise issues, not least because associated activities are often at their peak in the evening and late at night. Developers will need to bear in mind not only the noise that is generated within the premises from music but also the attendant problems of noise that may be made by customers arriving, leaving and congregating

outside the venue including external smoking areas, deliveries and collections and the use of car parks and access roads. Developers will need to bear in mind and incorporate noise mitigation at the design stage.

13. It is expected that all applications for this type of premises should properly address noise issues. As a general principle, music and noise from customers activity (talking, shouting and applauding) emanating from entertainment premises (including external areas such as balconies, gardens and smoking areas) should not be audible within any noise sensitive premises. Developers should assess the likely impact of the new entertainment premises upon the noise environment. The premises must be designed so to ensure that music and associated noise is controlled, so as to be inaudible inside any residential premises within the vicinity.
14. Inaudibility is defined by the Institute of Acoustics' Good Practice Guide on the Control of Noise from Pubs and Clubs 2003 as:
 - Entertainment Noise Level, LAeq (1 minute) should not exceed Representative Background Noise Level, LA90.
 - Entertainment Noise Level, L10 (5 minutes) should not exceed Representative Background Noise Level, L90, in any 1/3 octave band from 40Hz to 160Hz.or:

The use of Noise Rating (NR) curves, as discussed in the DEFRA document, *'Noise from Pubs and Clubs, Phase 1'* (2005), is an alternate way of establishing acceptable levels in noise sensitive premises where low frequency noise may be an issue. The following NR curves should be achieved:

 - NR 20 in bedrooms (23:00 to 07:00 hours).
 - NR 25 in all habitable rooms (07:00 to 23:00 hours).
 - Noise rating curves should be measured as a 15 minute linear Leq at the octave band centre frequencies 31.5 to 8 KHz.
15. All noise levels shall be taken with windows open or closed (whichever makes the music seem louder), or with alternatively provided acoustic ventilation over and above "background" ventilation. Other noise sources from these developments, such as air conditioning plant and kitchen odour extraction systems shall be treated as industrial type NGD.
16. Proposed developments will be assessed on a case by case basis and the design criteria may be modified depending on the nature of the business, frequency, time, duration and number of entertainment events and sensitivity of the area. It is expected that any likelihood of structure borne sound (and vibration) transmission problems will be separately assessed and that effective control measures will be included in proposals. Developers are encouraged to enter into pre-application discussions with the LPA to discuss these issues at an early stage.

17. Some commercial developments including fast food restaurants, night clubs and public houses can have particular impacts, not least because activities are often at their peak in the evening and late at night.

Multi Use Games Areas and Artificial Grass Pitches

18. Both Multi Use Games Areas (MUGA's) and Artificial Grass Pitches (AGP's) are becoming a more common feature in school and community redevelopments and play a key role in developing sporting opportunities for school children and the wider community. However, if inappropriately located and operated they can cause noise and other forms of disturbance to residents and businesses located in the vicinity of the development.
19. Outdoor MUGAs generally consist of one or numerous floodlit all-weather, or 3G pitches upon which football, rugby, hockey etc. is played. Where an outdoor MUGA is to be considered, the planning authority should consider its operating times, its frequency of use, the MUGA's orientation and line of sight to dwellings.
20. Recent guidance has been produced by Sports England 'Design Guidance Note Artificial Grass Pitches – Acoustics – Planning Implications, New Guidance for 2015' <https://www.sportengland.org/media/4515/agp-acoustics-planning-implications.pdf>
21. This guidance provides information on the application of appropriate noise criteria as detailed below in Table 2 below, assessment methods as well as examples of noise mitigation measures that can be implemented.

Table 2: MUGA & AGP - External Noise Standards

Noise Impact From MUGA or AGP	Development Outcome
50dB(A) LAeq, 1 hour	Normally acceptable

22. The LPA would expect that in most cases for any new or modified MUGAs or AGPs the Sports England guidance is applied and the application should demonstrate that these levels can be complied with. In other cases, it may be necessary to seek to achieve better standards due to particular sensitivity of the location or hours of

proposed use. In such cases it is recommended that early discussions are undertaken between the applicant and the LPA.

23. Developers should assess the likely impact of the new MUGA upon the noise environment. The MUGA must be designed so to ensure that noise associated with it is controlled, so as to be inaudible inside any residential premises within the vicinity.
24. The external noise level should not exceed 50 dB LAeq,T. at the boundary of the nearest noise sensitive premises, in accordance with World Health Organisation Guidelines of Community Noise 1999 and Sports England guidance. It is recognised, however, that the detrimental noise impact of a MUGA often may only become significant over a lengthy period of time; and that sound measurement data compiled over a relatively short time period may not accurately reflect the impact of a noise that will recur day upon day throughout the year and in particular the impact of peak noise occurrences such as loud voices / shouting, referee whistles and the impulsive noises such as ball impacts on fencing and backboards.
25. This being the case the measured or predicted sound level of < 50 dB LAeq,T will not necessarily be accepted as a *de facto* demonstration that noise from a proposed MUGA will not have an adverse noise impact.
26. This being the case, the MUGA Noise Level, LAeq (1 minute) should not exceed Representative Background Noise Level, LA90 to mitigate the impact of Lmax / peak noise occurrences such as loud shouting, referee whistles and the impulsive noise such as ball impacts on backboards.
27. Developers must also consider the following noise mitigation measures:
 - The use of bunds and environmental acoustic barriers to remove any direct line of sight and to reduce noise levels;
 - The provision of perimeter netting to prevent impact noise;
 - Use of neoprene dampeners on welded mesh fencing;
 - Padding and other dampening to backboards
 - Restrictions on hours and days of use;
 - User-management controls & codes of conduct;
 - Maximising any distances to nearby noise-sensitive premises.

Gyms

28. In recent years the popularity of leading a healthy lifestyle and the demand for gyms to be convenient and with 24 hours access locally, has led to an unprecedented development of commercial gyms, personal training gyms and specialist gyms. Whilst this is a positive the level of noise pollution generated by gyms, including

amplified music, structure borne sound from weights and plant equipment, has the potential to give rise to noise complaints.

29. Therefore, the presence of gyms in the built environment must be considered to ensure that they can mutually co-exist alongside the existing and future residential demand on city centres. Each type of gym comes with its separate issues related to noise impact and should be assessed against what activities are proposed to be undertaken within the gym.
30. Gyms should ideally be located away from residential units. However, this is not often possible and gyms are increasingly being located in mixed-use developments adjacent to habitable areas. In these cases high acoustic performance separating wall and floor constructions will normally be required to ensure that neighbouring residents are adequately protected
31. The noise that gyms generate can be broadly separated in to a number of categories;
 - Noise Breakout – This includes noise breaking out of the façade of the building from amplified music, patrons and general operations of a gym.
 - Plant Noise – Gyms will commonly require some sort of heat recovery system to regulate the temperature within the premises so external air conditioning units are common. The air handling units will be externally mounted and will generate noise that requires assessing.
 - Structure-borne Impact Noise Transfer (structurally reradiated high impulsive noise) – Fixed Weight Machines and Weight Drops can be from free weights, typically ranging up to a max of 45 - 50kg but also heavier weights from deadlifting activities which can range up to 50kg – 200kg.
 - Airborne Noise Transfer – Amplified music breaking through an adjoining partition floor or wall to neighbouring [residential dwellings](#) or commercial premises.
32. To appropriately mitigate the risk of complaints in relation to noise from gyms it is imperative that appropriate acoustic design targets are implemented. Minimum standards within the Building Regulations Part E are not suitable for gyms adjacent to commercial or residential premises and an increased level of sound insulation is required.
33. It is recommended that early discussions are undertaken with the Environmental Health Department to discuss the specific application and the sound insulation between commercial and residential development. Where gym premises structurally adjoin dwellings, ideally any airborne and structure borne noise shall be ‘inaudible’ inside the closest sensitive dwelling. Inaudibility is difficult to quantify as it dependent on the background sound level at the receptor, which cannot be

accurately assessed if the development is not yet constructed. In this scenario the following design criteria inside neighboring rooms are normally recommended:

- Daytime (07:00 – 23:00): NR15 L_{Max} for 31.5Hz, 63Hz and 125Hz / NR20 L_{Max} for 250 Hz – 8kHz
- Night (23:00 – 07:00hrs): NR10 L_{Max} for 31.5Hz, 63Hz and 125Hz / NR15 L_{Max} for 250 Hz – 8kHz
- Noise Breakout – The building envelope needs to be appropriately soundproofed, this will include the appropriate specification of the façade build up, glazed areas and doors.
- Plant Noise – Plant equipment needs to be located in an appropriate location and may also need acoustic enclosures or screening to mitigate the noise emissions.
- Structure Borne Noise – Free weights areas will need appropriate acoustic gym flooring to mitigate the impact from weights being dropped. Cardio machines will need appropriate isolation from the floor slab to mitigate vibration transfer (these are typically built into the machine). Specialist weights areas, that use greater than 50kg weights, will likely require helical spring systems in order to mitigate the weights being dropped from head height.
- Noise Breakthrough – Adjoining walls will need to be appropriately designed to mitigate airborne sound transference to adjoining residential and commercial spaces.

Nurseries / Childcare Facilities

34. Developers should assess the likely impact of any new nursery upon the noise environment and in particular in close proximity to residential premises. Nursery and similar uses can have large numbers and groups of children present and internal and external activities and external play areas can generate high levels of noise including regular individual peak noise occurrences such as loud voices, shouting and screaming.
35. Developers must consider the following noise mitigation measures:
 - Restrictions on hours and days of use;
 - Restrictions on the number of children using the nursery and its external play areas;
 - The use of acoustic barriers to remove line of sight and adsorptive barriers to reduce reflected noise;
 - The implementation of sound airborne and impact sound insulation measures where the proposed nursery adjoins noise-sensitive premises;
 - The layout of external play areas in relation to neighbouring noise-sensitive premises;
 - User-management controls;

36. Certain developments may be comprised of mixed residential and commercial / business uses. If nurseries and similar are proposed with residential units above then careful consideration should be given to good acoustic design to separate noisy activities such external play areas from noise sensitive uses. Residential habitable rooms and private external amenity areas should not be located directly above or in the direct line of sight of such noise sources. Also a high level of airborne sound insulation will be required for intervening walls and ceilings / floors and stairs between different floor levels for different uses structurally adjoined / connected.

Wind Turbines / Farms

Small to Medium Sized Wind Turbines (up to and including 50kW)

37. The Applicant/Developer must ensure that the assessment methodology used should demonstrate the following operational noise limits:

Daytime:

- The predicted daytime level of noise arising from the operating turbine should not exceed 35 dB LA90, 10 min at the façade of the nearest noise sensitive premises (free-field conditions).

or

- The predicted daytime level of noise arising from the operating turbine should not be >5 dB above background noise level (LA90) at the façade of the nearest noise sensitive premises; whichever is the greater (free-field conditions). The expected noise levels arising from an operating turbine should be compared with notional background noise levels that are considered representative of rural areas.

Night Time:

- The predicted night time level of noise arising from the operating turbine should not exceed 43 dB LA90, 10 min at the façade of the nearest noise sensitive premises (free-field conditions).

or

- The predicted night time level of noise arising from the operating turbine should not be >5 dB above background noise level (LA90) at the façade of the nearest noise sensitive premises; whichever is the greater (free-field conditions). The expected noise levels arising from an operating turbine should be compared with notional background noise levels that are considered representative of rural areas.

Intermediate to Large Turbines (>50kW)

38. For applications for wind turbines greater than 50kW, the assessment procedures detailed in ETSU-R-97 'The Assessment and Rating of Noise from Wind Farms', and

the Institute of Acoustics' "A good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise' (2013) should be followed.

- In the case of single turbines, or where large separation distances are involved, it will be permissible to show compliance with a noise level of 35 dB LA90, 10 min at the nearest noise sensitive premises (free-field conditions).
- It will be deemed acceptable if the daytime noise level is no more than 5 dB above the background level (LA90), or 35 dB (LA90, 10 min), at the façade of the nearest noise sensitive premises (free-field conditions); whichever is the greater.
- It will be deemed acceptable if the night time noise level is no more than 5 dB above the background level (LA90), or 43 dB (LA90, 10 min), at the façade of the nearest noise sensitive premises (free-field conditions). Whichever is the greater.
- It will be deemed acceptable if the daytime or night time noise level is no more than 5 dB above the background level (LA90), or 45 dB (LA90, 10 min), at the façade of any dwelling occupied by person(s) having a financial interest in the wind turbine(s) (free-field conditions); whichever is the greater.
- In certain circumstances the potential for amplitude modulation (AM) of the aerodynamic noise from turbine blades, sometimes referred to as "swish" or "thump" may also require specific consideration. This may require an acoustic character correction to be applied to noise limits.

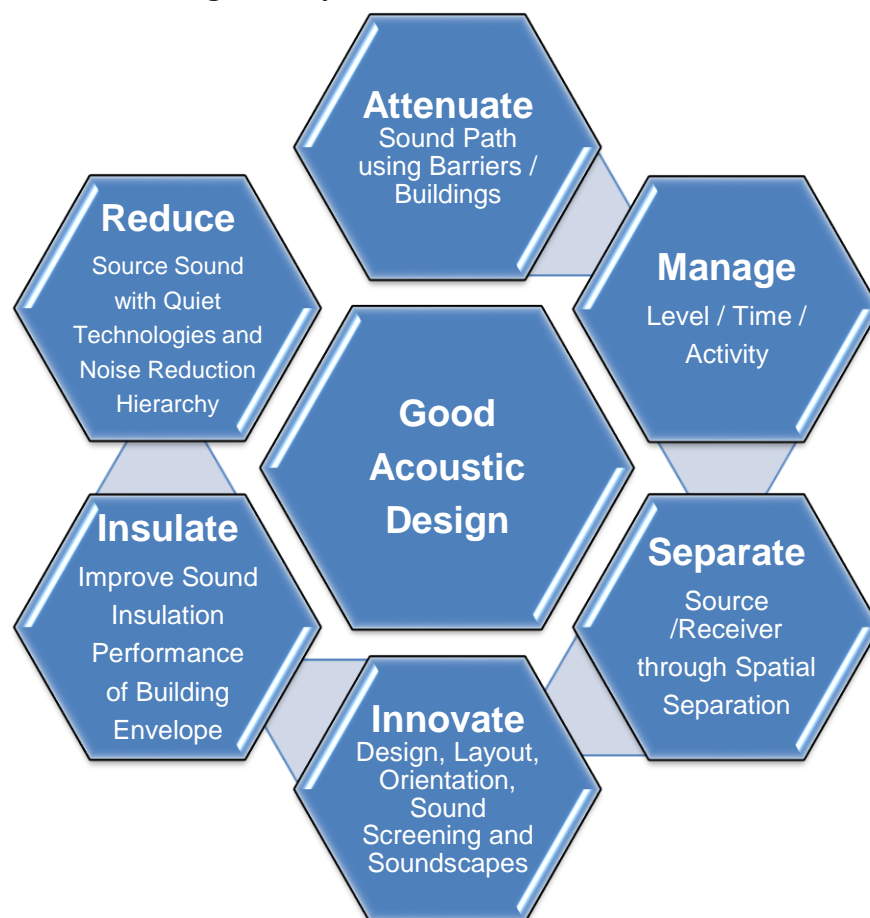
Agricultural buildings

39. For buildings and structures for agricultural use noise attenuation should be in accordance with 'BS 5502-32 Buildings and structures for agriculture. Guide to noise attenuation'.

Annex E: Good Acoustic Design

1. The use of good acoustic design is an inherent part of the recommended approach that is described in the SPD and will help to deliver planning and noise policy objectives. Good acoustic design should help produce sustainable buildings that provide healthy and quality living conditions for future occupants, that are sensitive to the likely expectations of future occupants and to the acoustic characteristics of the location, that are efficient in the use of resources and energy both during construction and subsequent occupation, and that are matched by an appearance that demonstrates good aesthetics as far as possible. Good acoustic design is about more than the numbers. It is a holistic design process that creates places that are both comfortable and attractive to live in, where acoustics is considered integral to the living environment. Figure 1 below presents the areas that should be considered when applying good acoustic design.

Figure 1: Good Acoustic Design Principles



Noise Sensitive Development – Good Acoustic Design

2. In the context of this SPD, good acoustic design is that which will achieve good acoustic standards, as far as is reasonably practicable, both internally (inside noise sensitive parts of the building(s) and externally (in spaces to be used for amenity purposes). Consideration of what is reasonable will include the practicability and availability of technical solutions as well as the associated costs and financial implications, legal requirements and health and safety issues.
3. Good acoustic design must also provide an integrated solution whereby good acoustic design principles are aligned with, or do not otherwise conflict with, other design aspects that will affect living conditions and the quality of life of the inhabitants or other sustainable design objectives and requirements. Solely relying on sound / noise insulation scheme for the building envelope to achieve acceptable acoustic conditions in new residential development, when other means may be available to achieve good acoustic standards or to reduce the need to rely on sound insulation of the building envelope is not regarded as good acoustic design.

Good Acoustic Design Critical Steps

4. The following questions illustrate the types of consideration that will help to achieve the good acoustic design of a noise sensitive scheme:
 - Has noise from the surrounding area been taken into consideration in arranging the site layout? For example, have residential units been located as far away as practicable from an adjacent noise source?
 - Is it practicable to use screening by existing structures or methods incorporated into the proposal to reduce noise levels affecting the sensitive facades and parts of the scheme?
 - Where practicable has the surrounding acoustic environment been taken into account in relation to the internal layout of residential units? Are bedrooms located on the quieter facades? Are gable ends and non-noise sensitive facades orientated towards the dominant source in preference to noise sensitive facades?
 - Will there be part of the habitable space in each unit which does not overlook the significant noise source? Have sensitive rooms been placed on the quietest façade? NB: Single aspect units where all the habitable space overlooks the significant noise source should be avoided.
 - Has consideration been given to suitable noise insulation of the external building envelope to mitigate unacceptable external noise? Remember that this is not currently covered by Building Regulations and can be overlooked if not considered at the planning stage. How will this affect the residential amenity and utility of the proposed scheme?
 - Has consideration been given to the acoustic quality of private or communal outdoor spaces within the scheme? What measures have been included to enhance the

acoustic quality of any outdoor amenity spaces? Where access to private or communal quiet outdoor amenity space cannot be, or has not been, provided within a scheme then is there ready access to a suitable quiet outdoor amenity space nearby?

5. The LPA will consider the use of Section 106 agreements to contribute to the improvement and enhancement of the acoustic environment; including, engagement by developers with the owners and operators of existing noise generating land uses to explore how noise emissions at source or on the transmission pathway beyond the proposed noise sensitive site boundary may be reduced or better managed. It is recognised that it may not always be possible to achieve good acoustic standards in all rooms within noise sensitive developments or at all external amenity spaces associated with new residential development. Where it is not possible to achieve good standards in every respect, the acceptability of the proposed development will be considered having regard to:
 - The degree (extent and magnitude) to which good acoustic standards cannot be achieved and whether acceptable acoustic standards can be achieved instead;
 - Measures which may help to off-set adverse impacts on certain parts of the dwelling or building. For example, whether there is access to a habitable room/s on a relatively quiet façade (i.e. a façade where noise is at least 15 dBA lower than the most exposed façade) or access to a relatively quiet external amenity space¹; and
 - Whether the achievement of good acoustic standards will give rise to undesirable consequences for other aspects of the living or working environment. For example, having to keep windows closed may result in adverse consequences on the comfort and health of occupants, and having to provide acoustic barriers or screens may result in significant visual impacts.

Noise Generating Development – Good Acoustic Design and Noise Control Measures

6. A mitigation hierarchy should be used as part of the design process. Noise control measures applied at source will be preferred to noise control on the transmission path from source to receiver. Façade protection measures represent the least preferred method of noise control. Noise control measures should be proportionate and reasonable and may include one or more of the following:
 - Engineering: reduction of noise at point of generation / source (e.g. by using quiet machines and/or quiet methods of working); containment of noise generated (e.g. by insulating buildings which house machinery and/or providing purpose-built barriers around the site);
 - Lay-out: adequate distance between source and noise-sensitive building or area and/or incorporating good design to minimise noise transmission through the use of screening by natural barriers, other buildings, or non-critical rooms in a building;
 - Administrative: limiting operating time of source; restricting activities and noise limits.

7. Early consultation between the applicant and the LPA about the possible use of noise control measures is desirable and may enable the measures to be incorporated into the design of the proposal before it is formally submitted for determination. This is likely to reduce costs in the long run and will help facilitate quicker decision making. The LPA may, otherwise, or in addition, seek further clarification on noise control measures which may introduce delays, and they may ensure that adequate noise control measures are included by applying planning conditions.
8. The NPPF places emphasis on good design in managing and mitigating the environmental impacts both from and on new development. This SPD recognises the importance of good acoustic design and noise problems can often be prevented or resolved through the careful design of noise sensitive and noise generating development at an early stage in the planning process.
9. The overall goal of this SPD is to encourage and reward good acoustic design and to ensure that noise is appropriately taken into account and that the measures used to mitigate and manage the impact of noise do not unacceptably compromise other planning objectives.

Good Acoustic Design Critical Steps

10. The following questions illustrate the types of consideration that will help to achieve the good acoustic design of a noise generating scheme:
 - Has the noise sensitivity and the typical existing acoustic environment of the surrounding area been taken into consideration in arranging the site layout? Have noise generating activities and/ or plant been located as far away as possible from noise sensitive receptors?
 - Is it practicable to use screening by existing structures or are other methods incorporated into the proposal to reduce noise from the scheme affecting the sensitive façades and other parts of nearby noise sensitive land uses?
 - Has consideration been given to including appropriate noise insulation of the building envelope to parts of the scheme that will generate noise? Are any doors and windows in sensible locations as regards noise impact on any neighbours? What about the roof or ceiling construction, it's often an acoustic weak point in commercial buildings?
 - Has the need to appropriately manage noise emissions from the site been taken into account in selecting plant and equipment?